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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-----------------------|------------------|
| 10/589,215 | 09/07/2006 | Ulrich Bischofberger | BISCHOFBERGER-8 PCT | 8398 |
| 25889 | 7590 | 03/04/2009 | EXAMINER | |
| COLLARD & ROE, P.C. 1077 NORTHERN BOULEVARD ROSLYN, NY 11576 | | | FOGARTY, CAITLIN ANNE | |
| | | ART UNIT | PAPER NUMBER | |
| | | 1793 | | |
| | | MAIL DATE | DELIVERY MODE | |
| | | 03/04/2009 | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|------------------------|-----------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/589,215 | BISCHOFBERGER, ULRICH |
| | Examiner | Art Unit |
| | CAITLIN FOGARTY | 1793 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 November 2008.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-11, 14 and 15 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-11, 14 and 15 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Status of Claims

1. Claims 1 – 11, 14, and 15 are pending where claims 1, 5, and 11 have been amended and claims 14 and 15 are new. Claims 12 and 13 have been cancelled.

Status of Previous Rejections

2. The 35 U.S.C. 112 second paragraph rejection of claims 5 and 7 is withdrawn in view of the amendment filed November 19, 2008.

The 35 U.S.C. 112 second paragraph and 35 U.S.C. 101 rejections of claims 12 and 13 is moot since claims 12 and 13 have been cancelled.

The 35 U.S.C. 103(a) rejection of claims 1 and 8-11 as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) has been withdrawn in view of the amendment filed November 19, 2008.

The 35 U.S.C. 103(a) rejection of claim 2 as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of Volume 7 of the 1998 9th Edition *ASM Handbook* has been withdrawn in view of the amendment filed November 19, 2008.

The 35 U.S.C. 103(a) rejection of claims 3 and 4 as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of Volume 15 of the 1988 9th Edition *ASM Handbook* has been withdrawn in view of the amendment filed November 19, 2008.

The 35 U.S.C. 103(a) rejection of claim 6 as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of the admitted prior art on p. 5 paragraph 3 of the instant specification has been maintained.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1, 5 – 11, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of the admitted prior art on p. 5 paragraph 3 of the instant specification.

Lee in view of Schmid is applied to claims 1 and 8 – 11 as set forth in the August 20, 2008 Office action. Lee in view of Schmid and further in view of the admitted prior art on p. 5 paragraph 3 of the instant specification is applied to claim 6 as set forth in the August 20, 2008 Office action.

With respect to the amended feature of instant claim 1, Lee in view of Schmid does not specifically teach that that base alloy is hot-formed at least once. In regards to instant claim 7, Lee in view of Schmid does not teach that hot forming is carried out with a degree of deformation greater than five times. However, col. 4 lines 40-61 of Lee teach a method for production of a material from an aluminum-based alloy where the base alloy is subsequently processed using conventional gravity casting. Although Lee does not teach that the aluminum-based alloy is further hot-formed with a degree of deformation greater than five times, it would have been obvious to one of ordinary skill in the art to subject the aluminum-based alloy to the known method of hot-forming with

a necessary degree of deformation in order to form the alloy into a desired final shape. Furthermore, it would have been obvious to one of ordinary skill in the art to apply the conventional hot-forming methods of extrusion, hot rolling, or forging to the base alloy of Schmid in the method of Lee with expected success as evidenced by the admitted prior art (see p. 5 paragraph 3 of the instant specification).

Regarding instant claim 5, Lee in view of Schmid does not specifically teach that the base alloy contains 0.5-1.5 wt% magnesium phosphate for the purpose of increasing the grain fineness of primary magnesium silicide that forms in the base alloy. However, col. 2 lines 48-52 of Schmid teach that up to 12 wt% of Si may be added to the base alloy to grain refine the alloy. Therefore, it would have been obvious to one of ordinary skill in the art that the additional silicon in Schmid is a functional equivalent to the magnesium phosphate of the instant invention since it performs the same function of increasing grain fineness. See MPEP 2144.06.

In regards to instant claims 14 and 15, col. 1 lines 23-30 and col. 4 lines 40-61 of Lee and col. 2 lines 24-48 of Schmid teach that the aluminum-based alloy may be used to make a piston for an internal combustion engine.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of the admitted prior art on p. 5 paragraph 3 of the instant specification as applied to claim 1 above, and further in view of Volume 7 of the 1998 9th Edition *ASM Handbook*.

Lee in view of Schmid and further in view of Volume 7 of the 1998 9th Edition *ASM Handbook* is applied to claim 2 as set forth in the August 20, 2008 Office action.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of the admitted prior art on p. 5 paragraph 3 of the instant specification as applied to claim 1 above, and further in view of Volume 15 of the 1988 9th Edition *ASM Handbook*.

Lee in view of Schmid and further in view of Volume 15 of the 1988 9th Edition *ASM Handbook* is applied to claims 3 and 4 as set forth in the August 20, 2008 Office action.

Response to Arguments

7. Applicant's arguments filed November 19, 2008 have been fully considered but they are not persuasive.

Arguments are summarized as follows:

a. The Lee et al. reference does not disclose performing a hot-forming, for example extrusion, hot-rolling or forging, on a material or base alloy that has been produced. Applicant's invented method as claimed in claim 1 includes performing a series of heat treatments only on a base alloy or material that has undergone a hot-forming and not on an article produced from gravity casting. It is not obvious to perform a hot-forming on a material produced with the composition of the formula found in Applicant's claim 1, and to thereafter perform additional heat treatment steps on the material.

b. Schmid cites the Mondolfo publication which teaches that aluminum alloys with more than 2% by weight magnesium silicide have problems with deformation. Applicant's method of producing an aluminum alloy includes adding

far more than 2% by weight of magnesium silicide, and is still sufficiently deformable to undergo a subsequent hot-forming. Applicant's invented method as recited in claim 1 can include adding up to 35% by weight magnesium silicide. Additionally, because magnesium is added in Applicant's process always in excess to the silicon that reacts with magnesium to form magnesium silicide, there is no excess silicon in the material produced by the Applicant's method. Thereby no ternary Al-Mg₂Si-Si eutectic alloy is formed, as can be formed in the lightweight cast material disclosed in Schmid. Applicant's inventive method produces an aluminum alloy material with a unique chemical composition resulting in a unique combination of properties including superior fatigue resistance and superior performance on static and dynamic tests. These properties are not found in the aluminum alloys of the prior art that are especially suitable for piston production.

Examiner's responses are as follows:

- a. As discussed above in the rejection for instant claim 1, Lee in view of Schmid does not specifically teach that that base alloy is hot-formed at least once. However, col. 4 lines 40-61 of Lee teach a method for production of a material from an aluminum-based alloy where the base alloy is subsequently processed using conventional gravity casting. Although Lee does not teach that the aluminum-based alloy is further hot-formed with a degree of deformation greater than five times, it would have been obvious to one of ordinary skill in the art to subject the aluminum-based alloy to the known method of hot-forming with

a necessary degree of deformation in order to form the alloy into a desired final shape. The Examiner's position is further enhanced by p.241-244 of Volume 14 of the 1988 9th Edition *ASM Handbook* which discloses that forging is a well known method applied to aluminum alloys in order to create a desired shape. The *ASM Handbook* also teaches that it is common to forge cast ingot forging stock. Therefore, it would have been obvious to one of ordinary skill in the art to subject the gravity cast aluminum-based alloy to the known method of hot-forming with a necessary degree of deformation in order to form the alloy into a desired final shape.

b. Although Schmid cites the Mondolfo publication which teaches that aluminum alloys with more than 2% by weight magnesium silicide have problems with deformation, col. 2 lines 34-40 of Schmid teach that the alloy of the Schmid invention comprises 5-25 wt% magnesium silicide which overlaps with the composition of magnesium silicide in the instant invention. Furthermore, col. 2 lines 34-40 of Schmid disclose that the alloy additionally contains a binary Al-Mg₂Si eutectic alloy and/or a ternary Al-Mg₂Si-Si eutectic alloy. Therefore, Schmid does not require the presence of a ternary Al-Mg₂Si-Si eutectic alloy. Furthermore, the instant claims do not recite that no ternary Al-Mg₂Si-Si eutectic alloy is formed and therefore Lee in view of Schmid is not required to teach this limitation.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAITLIN FOGARTY whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

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